997085

3 November 1965

MEMORANDUM FOR: Chief, Development Branch, P&DS

25X1A ATTENTION: [redacted]

THROUGH: Chief, Exploratory Development Laboratory Branch, P&DS

SUBJECT: Optical Dipoles

1. During our visit last month [redacted] we 25X1A were shown a demonstration of a device which [redacted] told us presented 25X1A the following effect: ultra-violet light falling on the back of a thin cell filled with a liquid through which a voltage gradient was maintained caused the liquid to change its optical density. If an image were to be projected on the cell in ultra-violet light while the cell was trans-illuminated by evenly distributed white light, the white light emerging from the cell should then faithfully reproduce the ultra-violet image. In essence, the cell would act as a modulator of white light, controlled by ultra-violet light.

2. In the demonstration the side of the cell towards the ultra-violet lamp was partly covered with UV-opaque plastic. When the cell was illuminated with UV and voltage turned on, the pattern of the plastic film was visible on the front of the cell. When I asked [redacted] where the 25X1A white light of the image was coming from, he said that it was being supplied from behind the cell and that the pattern we saw was the result of the varying density of the liquid in the cell. Upon close examination, however, it was obvious that the white light was being generated by fluorescence of the oxide coating on the back of the cell. [redacted] insisted that the zinc 25X1A oxide was present only to act as the necessary photoconductor in controlling the voltage gradient across the liquid, and hence its density. Even with the crude set-up [redacted] had arranged, it would have been easy to 25X1A put his theory to the test. If he could have shown that the contrast of the image varied with the voltage across the cell, there would have been clear evidence that the zinc oxide coating was acting as a "voltage divider." When, after considerable urging on my part, [redacted] did vary the voltage, 25X1A there was no evidence to the eye that the contrast actually was changing. Although [redacted] could have easily measured the contrast with an exposure 25X1A meter available to him there in the room, he was very reluctant to do so, and ended the demonstration immediately.

25X1A

3. In another part of the demonstration, [redacted] showed us the change in dielectric constant produced in a liquid after exposure to UV light. This effect is well-known in the literature; it is found in solutions of silver halides, metallic oxalates, and in many organic systems. To use 25X1A this effect in a light-modulating cell of the sort [redacted] proposes, though, introduces many unknown factors. First, sensitizing the photo-ionization reaction so that it will be triggered by the UV irradiation, but not by the white viewing light is an extremely complex problem. Second, matching the response rates of all the components to prevent cascading and lateral migration of ions will call for developments far beyond anything I have seen reported in the literature.

4. To sum up, I think that [redacted] was less than frank in discussing 25X1A his difficulties and that he more or less deliberately tried to mislead us by the demonstration. He seems to have consciously avoided doing the straightforward critical experiment which could prove (or disprove) his proposal. I recommend that his funds be stopped until he can give us evidence that he has tried a couple of simple experiments which I would be willing to discuss with him.

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[redacted]
Major, USAF
Exploratory Development Laboratory Branch
P&DS

Original and 1 - Addressee